	Application No.	Applicant(s)
Notice of Allowability	09/816,272	MURAYAMA ET AL.
	Examiner	Art Unit
	Khanh Tran	2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the Amendment filed on 07/05/2005* .

2. ☒ The allowed claim(s) is/are *12-27 which are renumbered as claims 1-16*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☒ All   b) ☐ Some*   c) ☐ None   of the:
       1. ☒ Certified copies of the priority documents have been received.
       2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
       3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the
          International Bureau (PCT Rule 17.2(a)).
    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
       1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
       Paper No./Mail Date _____.
    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)
1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____ .

1. The Amendment filed on 07/05/2005 has been entered. Claims 12-27 are pending in this Office action.

2. Claims 12-27 are renumbered as claims 1-16.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney Mike Kelly, Telephone 202-408-4450, on 09/27/2005.

- Regarding claim 12, in line 8, "the respective ones of" has been deleted; in line 24, "respective ones of" has been deleted; in line 25, "the respective ones of" has been deleted; in line 29, "the respective ones of" has been deleted.

- Regarding claim 19, in line 13, "first soft-out" has been changed to -- first soft-output --; in line 19, "soft-input" has been changed to -- soft-input input --; in line 23, "soft-input" has been changed to -- soft-input output --; in line 25, "soft-input" has been changed to -- soft-input input --; in line 31-32,

"respective ones of" has been deleted; in line 37, "soft-input" has been

changed to -- soft-input output --; in line 37, "the respective ones of" has been

deleted.

- Regarding claim 26, in line 2, "a computer" has been changed to -- a

computer to perform a decoding method --; in line 16, "soft-input" has been

changed to -- soft-input input --; in line 28, "said soft-output" has been

changed to -- said third soft-output --; in line 32-33, "respective ones of" has

been deleted; in line 38, "the respective ones of" has been deleted.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

4. Claims 12-18 are allowed.

Regarding claim 12, claim is allowed over prior art of record because the cited

references taken individually or in combination fail to particularly disclose a decoding

apparatus for carrying out decoding of codes subjected to serially concatenated code

modulation, the decoding apparatus comprising uniquely distinct features "*a second de-*

interleaving means serially concatenated with the second soft-output decoding means in

the final stage to rearrange data of (k+1) bits of a soft-input input so that a bit array of

data of (k+1) bits rearranged by said first interleaving means is returned to a bit array of

data of (k+1) bits coded by said first coding means" and "*a third soft-output decoding*

means provided corresponding to said first coding means and serially concatenated

with said second de-interleaving means to carry out soft-output decoding using priori

probability information with respect to code bits of (k+1) bits which are a soft-input

output from said second de-interleaving means, and priori probability information with

respect to information bits of (k+1) bits which are a soft-input input" and "*a fourth*

interleaving means for interleaving order of bits constituting data comprising a bit series

of (k+1) pieces of a soft-input output from said third soft-output decoding means on the

basis of the same exchange position information as that of said first interleaving

means". It is noted that the closest prior art; Rhines et al. (US 5,392,299) disclosing the

detection and correction of errors in digital data transmitted by or stored in a media

channel is provided by processing the data through a triple orthogonally interleaved

error correction system, Brink (US 6,353,911 B1) disclosing a method and apparatus for

iteratively decoding a multilevel modulated signal in which the soft output information of

a channel decoder is fed back and utilized by a tailored soft de-mapping device in order

to improve the decoding result by further iterative decoding steps. However, Rhines et

al. and Brink, either singularly or in combination, fail to anticipate or render the above

underlined limitations obvious.

     5. Claims 19-25 are allowed.

     Regarding claim 19, claim is allowed over prior art of record because the cited

references taken individually or in combination fail to particularly disclose a decoding

method for carrying out decoding of codes subjected to serially concatenated code

modulation, the decoding method comprising uniquely distinct features "*a second de-interleaving step for rearranging data of (k+1) bits of a soft-input processed by said carrying out step input so that a bit array of data of (k+1) bits rearranged by said first interleaving step is returned to a bit array of data of (k+1) bits coded by said first coding step*" and "*third soft-output decoding, corresponding to said first coding step, using priori probability information with respect to code bits of (k+1) bits which are a soft-input rearranged by said second de-interleaving step, and priori probability information with respect to information bits of (k+1) bits which are a soft-input*" and "*fourth interleaving order of bits constituting data comprising a bit series of (k+1) pieces of a soft-input output produced by said third soft-output decoding step on the basis of the same exchange position information as that of said first interleaving step*". It is noted that the closest prior art; Rhines et al. (US 5,392,299) disclosing the detection and correction of errors in digital data transmitted by or stored in a media channel is provided by processing the data through a triple orthogonally interleaved error correction system, Brink (US 6,353,911 B1) disclosing a method and apparatus for iteratively decoding a multilevel modulated signal in which the soft output information of a channel decoder is fed back and utilized by a tailored soft de-mapping device in order to improve the decoding result by further iterative decoding steps. However, Rhines et al. and Brink, either singularly or in combination, fail to anticipate or render the above underlined limitations obvious.

6. Claims 26-27 are allowed.

Regarding claim 26, claim is allowed over prior art of record because the cited

references taken individually or in combination fail to particularly disclose a recording

medium having recorded a decoded program capable of being controlled by a computer

for carrying out decoding of codes, wherein the decoding method comprises for

comprising uniquely distinct steps "*a second de-interleaving step for rearranging data of*

(k+1) bits of a soft-input processed by said carrying out step input so that a bit array of

data of (k+1) bits rearranged by said first interleaving step is returned to a bit array of

data of (k+1) bits coded by said first coding step" and "*third soft-output decoding,*

corresponding probability information with respect to code bits of (k+1) bits which are a

soft-input rearranged by said second de-interleaving step, and priori probability

information with respect to information bits of (k+1) bits which are a soft-input input" and

"*fourth interleaving order of bits constituting data comprising a bit series of (k+1) pieces*

of a soft-input output produced by said soft-output decoding step on the basis of the

same exchange position information as that of said first interleaving step". It is noted

that the closest prior art; Rhines et al. (US 5,392,299) disclosing the detection and

correction of errors in digital data transmitted by or stored in a media channel is

provided by processing the data through a triple orthogonally interleaved error

correction system, Brink (US 6,353,911 B1) disclosing a method and apparatus for

iteratively decoding a multilevel modulated signal in which the soft output information of

a channel decoder is fed back and utilized by a tailored soft de-mapping device in order

to improve the decoding result by further iterative decoding steps. However, Rhines et

al. and Brink, either singularly or in combination, fail to anticipate or render the above

underlined limitations obvious.

Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Conclusion

7. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Khanh Tran whose telephone number is 571-272-3007.

The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

KCT   *Thanhcong Tran*   09/30/2005

                        Examiner   KHANH TRAN

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